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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,113	03/30/2004	Lei Shao	884.B52US1	5163

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EXAMINER	
TRAN, KHAI	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
06/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/814,113	SHAO, LEI	
	Examiner	Art Unit	
	KHAI TRAN	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 August 2004 and 02 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13-17 and 33-36* is/are allowed.

6)☒ Claim(s) *1-4,18,19,22-25 and 37-42* is/are rejected.

7)☒ Claim(s) *5-12,20,21 and 26-32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5 sheets*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The preliminary amendments filed 8/3/2004 and 11/2/2004 has been entered. Claims 1-42 are pending in this Office action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 18-19, 22-25, 37-39, and 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giannakis et al (U.S. Pat. 7,224,744) in view of Raleigh et al (U.S. Pat. 6,452,981).

Regarding claim 1, Giannakis et al disclose a multicarrier transmitter comprising: a precoder to encode a plurality of symbol vector by multiply each of the symbol vectors by a complex field matrix to generate precoded symbol vectors (col. 3, lines 36-63); a partitioner to group the precoded symbol vectors into a plurality of groups, each group having more than one of the precoded symbol vectors (col. 8, line 49 to col. 9, line 60). Giannakis et al fail to explicitly disclose a space-frequency symbol mapper to map precoder symbols of the precoded symbol vector to one of a spatial channel at least in part based on the precoded symbol's group and the precoded symbol's position within the group.

Raleigh et al disclose a space-frequency symbol mapper to map precoder symbols of the precoded symbol vector to one of a spatial channel at least in part based

on the precoded symbol's group and the precoded symbol's position within the group (a transmitter space-frequency pre-processor 30, col. 6, lines 21-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to map precoded symbols of the precoded symbol vectors as taught by Raleigh et al into the teachings of Giannakis et al for generating one of a plurality of subcarriers of the multicarrier communication channel. The motivation would optimize the spatial vector weights and obtain various desirable performance enhancements.

Regarding claim 2, Giannakis et al disclose a symbol mapper to generate a serial symbol stream from an input serial bit stream (col. 3, lines 42-63); a serial-to-parallel converter (S/P converter 12) to generate the plurality of parallel symbol vectors from the serial symbol stream.

Regarding claim 3, Giannakis et al disclose inverse Fast Fourier transform (IFFT) circuitry (col. 5, lines 32-59).

Regarding claim 4, Giannakis et al disclose the precoder being a linear-square precoder (col. 2, lines 12-19).

Claims 18-19 are similar to claim 1. Therefore, claims 18-19 are rejected under a similar rational.

Claims 22-25 are similar to claims 1-4. Therefore, claims 22-25 are rejected under a similar rational.

Claims 37-39 are similar to claims 1-3. Therefore, claims 37-39 are rejected under a similar rational.

Claims 40-42 are similar to claims 1-3. Therefore, claims 40-42 are rejected under a similar rational.

Allowable Subject Matter

4. Claims 13-17, and 33-36 are allowed.

5. Claims 5-12, 20-21, 26-32, objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is an examiner's statement of reasons for allowance: none of the prior art of the record discloses or suggests that the multicarrier receiver comprising: a demultiplexer to generate groups of symbol vectors by combining corresponding subcarrier frequency components of received symbol vectors; a null canceller associated with each group of symbol vectors to perform null canceling on a per-subcarrier basis for symbol vectors of the associated group based on a decoded symbol vector, the null canceller to generate null-cancelled symbol vectors; a decoder associated with each group to decode layers of symbols of the associated group and multiply an output of the decoder one layer at a time by a complex-field matrix to regenerate symbol vectors for the null canceller.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Joo et al (US 2003/0095533 A1) disclose a STFBC coding/decoding apparatus and method in an OFDM mobile communication system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHAI TRAN whose telephone number is (571) 272-3019. The examiner can normally be reached on 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JAY PATEL can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KHAI TRAN
Primary Examiner
Art Unit 2611

KT
June 8, 2007

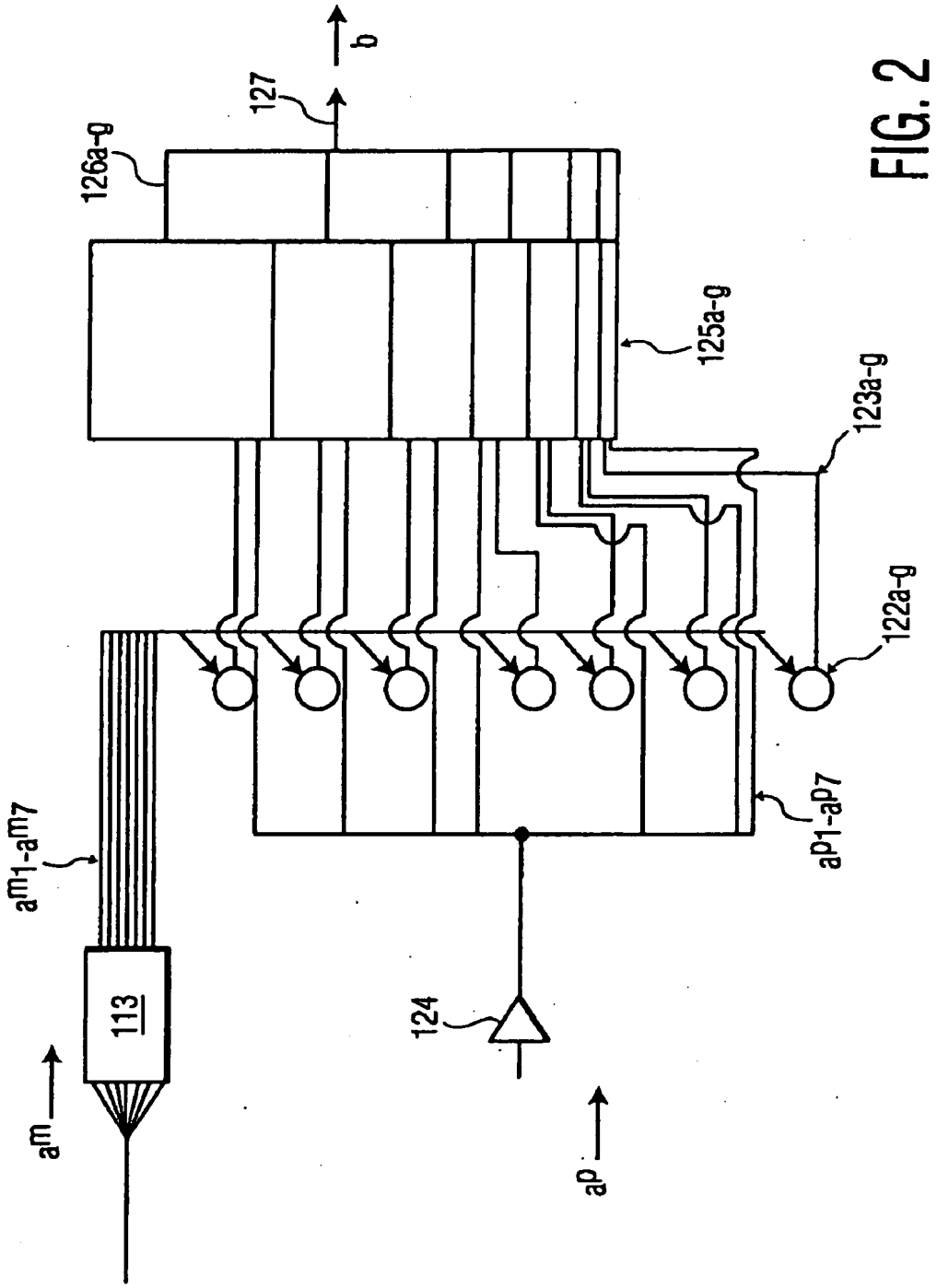

FIG. 2